

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1-9. (canceled)

10. (new) An isolated mutant kanamycin nucleotidyltransferase comprising the sequence of SEQ ID NO:1 modified by at least one point mutation chosen from Met57Leu, Ser94Pro, Ser203Pro, Asp206Val, His207Gln, Ser220Pro, Ile234Val, and Thr238Ala, and having improved thermostability as compared to SEQ ID NO:1, wherein the mutant kanamycin nucleotidyltransferase is additionally modified only at one or more amino acid residues chosen from positions 2, 17, 25, 61, 62, 66, 75, 91, 102, 112, 116, 117, 159, 188, 190, 196, 197, 198, 199, 211, and 246.

11. (new) An isolated mutant kanamycin nucleotidyltransferase comprising the sequence of SEQ ID NO:1 modified by at least one point mutation chosen from Met57Leu, Ser94Pro, Ser203Pro, Asp206Val, His207Gln, Ser220Pro, Ile234Val, and Thr238Ala, and having improved thermostability as compared to SEQ ID NO:1, wherein the mutant kanamycin nucleotidyltransferase has at least 90% sequence identity to SEQ ID NO:1.

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12. (new) The mutant kanamycin nucleotidyltransferase according to claim 11, wherein the mutant kanamycin nucleotidyltransferase contains 9, 10, 11, 13, or 19 point mutations when compared to SEQ ID NO:1.

13. (new) The mutant kanamycin nucleotidyltransferase according to claim 11, wherein the mutant kanamycin nucleotidyltransferase contains 1, 2, 4, 8, or 9 point mutations when compared to SEQ ID NO:2.

14. (new) The mutant kanamycin nucleotidyltransferase according to any one of claims 10, 11, 12, or 13, wherein the activity of kanamycin nucleotidyltransferase substantially remains after heat treatment at 60°C for 10 minutes.

15. (new) The mutant kanamycin nucleotidyltransferase according to any one of claims 10, 11, 12, or 13, wherein the residual activity of kanamycin nucleotidyltransferase after heat treatment at 70°C for 10 minutes is substantially the same as or higher than that of a kanamycin nucleotidyltransferase comprising the sequence of SEQ ID NO:2.

16. (new) A method for producing a mutant kanamycin nucleotidyltransferase having improved thermostability as compared to SEQ ID NO:1 according to any one of claims 10, 11, 12, or 13, comprising the step of introducing at least one point mutation chosen from Met57Leu, Ser94Pro,

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Ser203Pro, Asp206Val, His207Gln, Ser220Pro, Ile234Val, and Thr238Ala to the sequence of SEQ ID NO:1.

17. (new) An isolated mutant kanamycin nucleotidyltransferase comprising the sequence of SEQ ID NO:2 modified by a mutation selected from the group consisting of: Met57Leu, Ala62Val, Ser94Pro, Ser203Pro, Asp206Val, His207Gln, Ser220Pro, Ile234Val, and Thr238Ala, and combinations thereof, wherein said nucleotidyltransferase has improved thermostability as compared to SEQ ID NO:2.

18. (new) An isolated mutant kanamycin nucleotidyltransferase comprising the sequence of SEQ ID NO:1 modified by at least one point mutation chosen from Met57Leu, Ser94Pro, Ser203Pro, Asp206Val, His207Gln, Ser220Pro, Ile234Val and Thr238Ala, and having improved thermostability as compared to SEQ ID NO:1.